Gait Assessment of Neurologically Challenged Patients

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Objectives

- Understand normal gait mechanics and terminology
- Recognize pathological gait patterns commonly associated with visual and vestibular deficits in neurologically challenged patients.
- Administer the Functional Gait Assessment and the 10-Meter Walk Test
Normal Gait

“repetitious sequence of limb motion to move the body forward while simultaneously maintaining stance stability
Observational Gait Analysis

• Qualitative visual description of an individual’s upper and lower extremities, pelvis and trunk motions during ambulation.
Normal Human Gait

<table>
<thead>
<tr>
<th>STANCE: 62%</th>
<th>SWING 38%</th>
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<tbody>
<tr>
<td>IC</td>
<td>ISw</td>
</tr>
<tr>
<td>LR</td>
<td>MSw</td>
</tr>
<tr>
<td>MSt</td>
<td>TSw</td>
</tr>
<tr>
<td>TSt</td>
<td></td>
</tr>
<tr>
<td>PSw</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Weight Acceptance</th>
<th>Single Limb Support</th>
<th>Swing Limb Advancement</th>
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</thead>
</table>
Stance Phase

- **Initial Contact (IC):** The moment when the foot contacts the ground
Stance Phase

- **Loading Response (LR):** Weight is rapidly transferred onto the outstretched limb, the first period of double-limb support.
Stance Phase

- **Mid-Stance (MSt):** The body progresses over a single, stable limb.
Stance Phase

- **Terminal Stance (TSt)**: Progression over the stance limb continues. The body moves ahead of the limb and weight is transferred onto the forefoot.
Stance Phase

- **Pre-Swing (PSw):** A rapid unloading of the limb occurs as weight is transferred to the contralateral limb.
Swing Phase

- **Initial Swing (ISw):** The thigh begins to advance as the foot comes up off the floor.
Swing Phase

- **Mid-Swing (MSw):** The thigh continues to advance as the foot comes up off the floor.
Swing Phase

- **Terminal Swing (TSw):** The knee extends; the limb prepares to contact the ground for Initial Contact.
Pathological Gait Analysis
Common Descriptive Terms for Abnormal Gait

- Antalgic
- Hiking
- Ataxic
- Trendelenberg
- Athetoid
- Toe Drag
- Festinating
- Vaulting
- Scissoring
- Unstable
- Shuffling
- Extensor syngery
- Steppage
- Flexor syngery
Qualitative Gait Analysis Form
Quantitative Gait Analysis
Functional Gait Assessment

- Standardized test for assessing postural instability during various walking tasks
- 10-item gait assessment based on the Dynamic Gait Index
- Equipment: Stopwatch, marked walking area, shoe box for obstacle, set of steps
- Scoring: 0 for severe impairment to 3 for normal performance; maximum score possible is 30.
Functional Gait Assessment

- Gait Level Surface
- Change in Gait Speed
- Gait with Horizontal Head Turns
- Gait with Vertical Head Turns
- Gait and Pivot Turn
- Step over Obstacle
- Gait with Narrow Base of Support
- Gait with Eyes Closed
- Ambulation Backwards
- Steps
# Functional Gait Assessment

## Reference Group Data

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Min Score</th>
<th>Max Score</th>
<th>Mean</th>
<th>SD</th>
<th>CI</th>
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<tbody>
<tr>
<td>40-49</td>
<td>27</td>
<td>24</td>
<td>30</td>
<td>28.9</td>
<td>1.5</td>
<td>28.2-29.5</td>
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<td>50-59</td>
<td>33</td>
<td>25</td>
<td>30</td>
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<td>28</td>
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<td>TOTAL</td>
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<td>10</td>
<td>30</td>
<td>26.1</td>
<td>4.0</td>
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10-Meter Walk Test

- Examines gait speed

To administer test:
- Measure a 10 meter course and mark ends with tape
- Position subject 3 feet behind tape
- Instruct the subject to walk at a comfortable rate until he is 3 feet past the time line
- Repeat up to 3 times and average the times
- Instruct the subject to walk as above, but as fast as possible
- Repeat up to 3 times and average the times
# 10-Meter Walk Test

<table>
<thead>
<tr>
<th>Gender/Decade</th>
<th>Comfortable (m/min)</th>
<th>Maximum (m/min)</th>
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<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
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<td>20s</td>
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CASE STUDY
QUESTIONS????
REFERENCES


